

**SONY.**

CRX - 160E

# CD-R/RW Drive Unit

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CRX - 160E

## CD-R/RW Drive Unit

User's Guide

## Owner's Record

The model and serial numbers are located on the top of the drive. Record these numbers in the spaces provided below. Refer to them whenever you call upon your sales representative regarding this product.

**Model No.** \_\_\_\_\_ **Serial No.** \_\_\_\_\_

## Safety Regulations

### WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

### CAUTION

As the laser beam in this CD writer is harmful to the eyes, do not attempt to disassemble the cabinet. Refer servicing to qualified personnel only.

The use of optical instruments with this product will increase eye hazard.

The use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation.



This label is located on the drive unit's internal chassis.

CAUTION	INVISIBLE LASER RADIATION WHEN OPEN. DO NOT STARE INTO BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS.
VORSICHT	UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT IN DEN STRAHL BLICKEN, AUCH NICHT MIT OPTISCHEN INSTRUMENTEN.
ADVARSEL	USYNLIG LASERSTRÅLING VED ÅBNING SE IKKE IND I STRÅLEN-HELLER IKKE MED OPTISKE INSTRUMENTER.
ADVARSEL	USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES. STIRR IKKE INN I STRÅLEN ELLER SE DIREKTE MED OPTISKE INSTRUMENTER.
VARNING	OSYNLIG LASERSTRÅLNING NÅR DENNA DEL ÄR ÖPPNAD. STIRRA EJ IN I STRÅLEN OCH BETRAKTA EJ STRÅLEN MED OPTISKA INSTRUMENT.
VARO!	AVATTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ TUIJOTA SÄTEESEEN ÄLÄKÄ KATSO SITÄ OPTISEN LAITTEEN LÄPI.

This label is located on the top of the drive unit enclosure.

This unit uses CD-RW discs with the following mark.



This unit uses CD-R discs with the following mark.



This unit uses CD-ROM discs with the following mark.



When you use this unit as a CD player, use compact discs with the following mark.



### WARNING —

You are cautioned that any changes or modifications not expressly approved in this manual will void your warranty.

### Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This CD-R/RW drive unit is classified as a CLASS 1 LASER PRODUCT.



The CLASS 1 LASER PRODUCT label is located at the top of the enclosure.

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## Trademarks

- MS-DOS is a registered trademark of Microsoft Corporation.
- IBM PC, PC/XT, and PC/AT are registered trademarks of International Business Machines Corporation.
- HP Vectra is a registered trademark of the Hewlett-Packard Company.
- Molex is a registered trademark of Molex, Inc.
- AMP is a registered trademark of AMP, Inc.
- Macintosh is a registered trademark of Apple Computer.

## Introduction

### Features

The CRX160E is an internal CD-R/RW (Compact Disc Recordable/ReWritable) drive unit designed for use with personal computers. It conforms to the "MultiRead" specification.

### General

- 5 1/4 inch half-height drive form factor.
- Power loading and eject of a disc.
- Housed in a casing with an airtight frame.
- 4 Mbyte buffer memory.
- Supports Power saving mode and Sleep mode.

### Supported disc formats

- Reads and writes data in each: CD-DA, CD Extra, CD-Rom (mode 1), CD-Rom XA (mode 2 form 1 & 2), CD-I (mode 2 form 1 & 2), Video CD and CD-text.
- Reads data in Photo CD (Single and Multi session).
- The CRX-160E conforms to the world wide standards set out in the "Orange Book Part II version 3.1" for CDR, the "Orange Book Part III version 2.0" for CD-RW, the "Red Book" for CD-Audio and the "Yellow Book" for CD-Rom.

### Supported write methods

- Disc At Once, Session At Once, Track At Once, Variable Packet, Fixed Packet (max packet size = 2088.9Kb) and Track Reservation.

### Performance

- Supports CD-R write speeds of 1X, 2X, 4X 8X and 12X.
- Supports CD-RW write speeds of 2X, 4X and 8X.
- Supports read-only speeds up to 32X.
- Real time error correction and real time layered error correction.
- Fast access times ensuring reliable high-speed data access.

### Audio

- Outputs 16-bit digital data over the ATA interface.
- Audio line output and headphones jack for audio CD playback.

## ■ Software Requirements

To use this CD drive you will require two types of software, one for reading discs the other for writing discs.

**Reader:** This drive uses a standard ATAPI interface. Most modern operating systems have driver software built in to enable the use of this drive as a CD reader. This includes Windows 95, 98, NT 4.0, 2000 and Macintosh, hence no additional drivers are required for reading discs. *For MS-DOS, drivers can be downloaded from:*

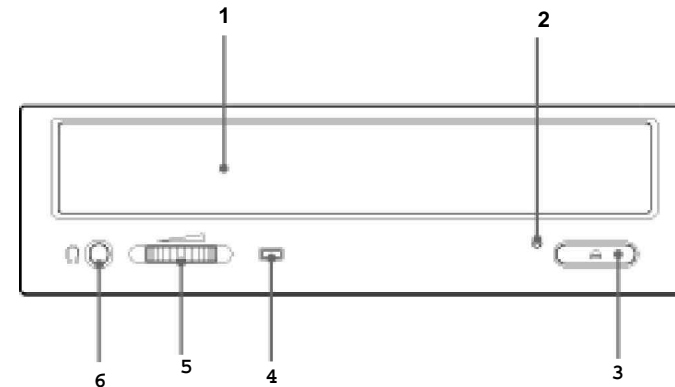
<http://www.sony.com.au/support/itp>

**Writer:** Authoring software will be required. There are many varieties. Please be sure that the version of software you are using is compatible with the CRX-160E. You should check this on the software manufacturers web site or at:

<http://www.sony.com.au/support/itp>

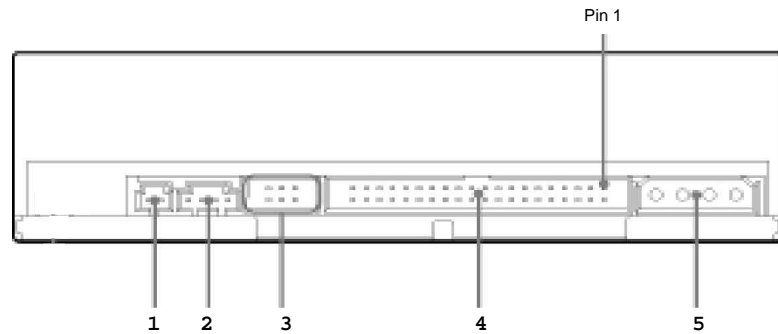
## Location and Function of Parts and Controls

### Front Panel



- 1 Disc tray**  
Accepts a CD-ROM, CD-R and CD-RW disc on its tray.
- 2 Emergency eject hole**  
Insert a fine rod into this hole to eject the tray manually in emergencies.
- 3 Eject button**  
Opens and closes the disc tray.
- 4 Busy indicator**  
This indicator shows the unit's status in various phases of operation.  
\* Seek, read and write: Flashes amber  
\* Error: Lights up amber and stays lit
- 5 Volume control**  
Controls the volume of the analog audio output provided via a headphones jack.
- 6 Headphones jack**  
Provides two channel analog audio output.

## Rear Panel



- 1 **Unused**
- 2 **ANALOG AUDIO connector**  
Outputs analog audio signals.
- 3 **Configuration Jumpers**  
See page 11 for details.
- 4 **INTERFACE CONNECTOR (IDE bus)**  
Connect to ATA host adapter.
- 5 **DC INPUT (power-in) connector**  
Connect to the power supply of the host computer.

## Precautions

### ■ Installation

- Avoid placing the drive in a location subject to:
    - high humidity
    - high temperature
    - excessive dust
    - mechanical vibration
    - direct sunlight.
- We recommend to use the drive in a horizontal or vertical position. Do not use it in a tilted position.

### ■ Operation

- Do not move the drive during operation. This may cause it to malfunction during reading or writing.
- Avoid exposing the drive to sudden changes in temperature as condensation may form on the lens inside the drive as a result. Should the surrounding temperature suddenly rise while the drive is on, wait at least one hour before you turn off the power. Operating the drive immediately after a sudden increase in temperature, may result in a malfunction during reading or writing.

### ■ Transportation

- Close the disc drawer before moving the drive.
- Keep the original packing materials for future transport of the drive.

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## System Setup

To use this CD-R/RW device, the following components are required:

- Personal Computer with an IDE bus (ATA compliant)
- IDE Interface cable (40 to 40 pin flat cable)
- Software -

**Device driver (for reading discs only) -**

This is included with most modern operating systems.  
DOS device drivers can be downloaded from:

<http://www.sony.com.au/support/itp>

**Authoring Software (for writing discs) -**

Check with the software manufacturers web site to ensure the version of your software supports the CRX-160E.

A list of compatible software can also be found at:

<http://www.sony.com.au/support/itp>

## Installing the Drive in Your Computer

Consult your computers User Manual for instructions on how to add new hardware. Be sure to follow their anti-static precautions.

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### Preparation

The following parts and tools will be required to mount the drive in your computer:

- Four screws 3 mm in diameter and 6 mm in length.
- A screwdriver to suit.
- Two mounting rails if your computer has mounting tracks.

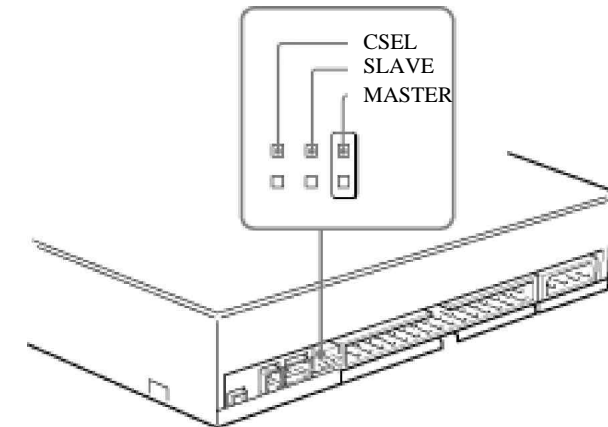
Do not turn on the power of the computer before completing the entire installation process.

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## Setting the Jumpers

Set the jumpers on the rear of the drive in accordance with the configuration of your computer system.

The illustration below shows the jumpers set to the “MASTER” position, this is the default set by the factory.



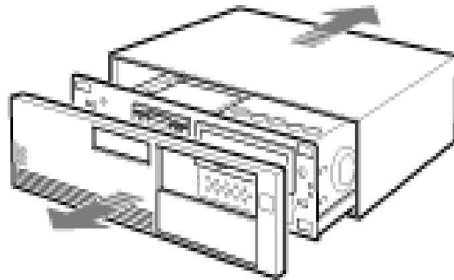
Your computer should have a PRIMARY IDE bus and a SECONDARY IDE bus. Each bus can have one MASTER and one SLAVE device connected to it. Follow the configuration guidelines below for optimum performance and reliability.

- Set the CRX-160E as the MASTER device.
- The CRX-160E can be connected to either the PRIMARY or SECONDARY bus, however if you have an IDE Hard disk on your computer the hard disk should be set as the MASTER device on the PRIMARY bus. Hence the CRX-160E must be set as the PRIMARY device on the SECONDARY bus.
- Do not have a CD-ROM reader and a CD writer on the same IDE bus (*ie: both on the SECONDARY bus*). This will cause problems if copying from CD to CD.

Some personal computers may use CSEL in place of the MASTER/SLAVE selection. In this case, remove the existing jumper from MASTER or SLAVE, and set it on CSEL. When the CSEL is set high, the drive is designated as Drive 1. Consult your PC manufacturer, IDE Card manufacturer or dealer for further details.

## Opening the Computer

Refer to your computers user manual for instructions on how to open the computer.



## Mounting the Drive

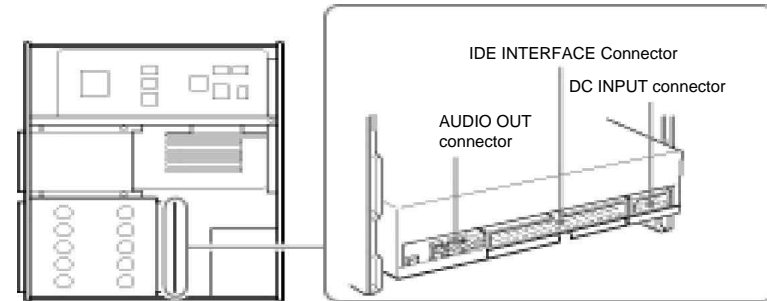
Do not mount the drive at an angle, it is only designed to be operated horizontally or vertically.

Some computers chassis require mounting rails on each side of the drive when installing new drives. If your system requires these rails you should contact your computer supplier.

## Connecting the Drive

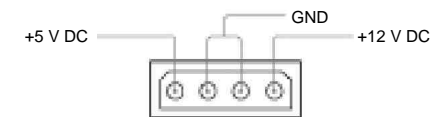
The drive should be connected to the computer with the following connectors:

- DC INPUT connector.
- AUDIO OUT connector (if you plan to connect audio equipment).
- IDE INTERFACE connector.

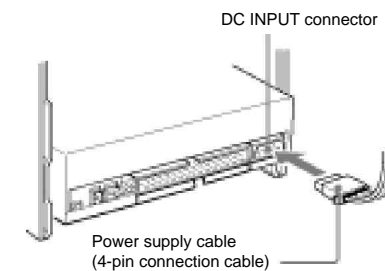


### ■ DC INPUT connector

The pin assignment for the DC connector is as follows.



After matching the beveled edges, insert the plug of the power supply cable to the DC INPUT connector on the rear of the drive and push it firmly in place.



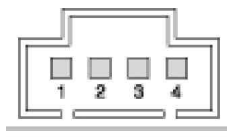
### ■ Frame ground

When installed the CD writer unit should have its metal chassis in contact with a grounded metal area of the computers frame.

This normally occurs naturally when the drive is mounted into one of the computers spare drive bays.

### ■ AUDIO OUT connector

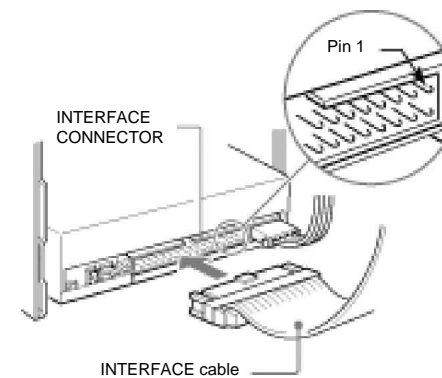
The pin assignment for the audio out connector is as follows:



pin	Audio Signal
1	R signal
2	ground
3	ground
4	L signal

### ■ IDE INTERFACE connector

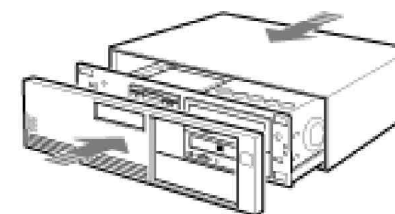
- 1 Firmly insert one end of the interface cable into the INTER-  
FACE CONNECTOR.



- 2 Attach the other end of the cable to the PRIMARY or  
SECONDARY IDE interface connectors on the computers  
mainboard.  
*Refer to your computers user manual for more information on  
where these connectors will be located.*

## Closing the Computer

Refer to your computers user manual for instructions on how to close the computer.





# Installing the Software

### *To use the drive as a CD-Rom Reader.*

Windows 95, 98, NT 4.0, 2000 or Macintosh systems should detect the drive at start up and the appropriate ATAPI drivers be installed automatically.

If you wish to use the drive with MS-DOS you will require the MSCDEX extension (*available from Microsoft*) and Sony's ATAPI device driver (*available from <http://www.sony.com.au/support/itp>*).

### *To use the drive as a CD Writer.*

CD Authoring software will be required. There are many varieties, all have different features. Please be sure that the version of software you are using is compatible with the CRX-160E. This can be checked on the software manufacturers web site, or for a list of compatible software refer to Sony Australia's web site:

<http://www.sony.com.au/support/itp>

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# Using Discs

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## Storing Discs

- Do not store the disc in a location subject to:
  - high humidity
  - high temperature
  - excessive dust
  - direct sunlight

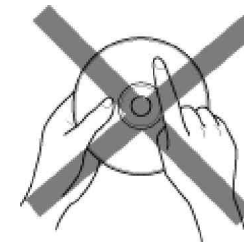
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## Care of Discs

- Hold the disc by its edge. Do not touch the surface.



- Do not wipe a CD-R disc or CD-RW disc with a cleaner before recording data. To avoid scratching the recording surface, blow away dust using an air blower.
- Data cannot be recorded if the recording surface is contaminated.

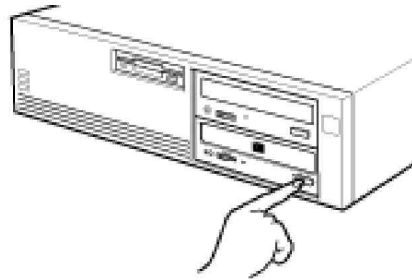


# Operating the Drive

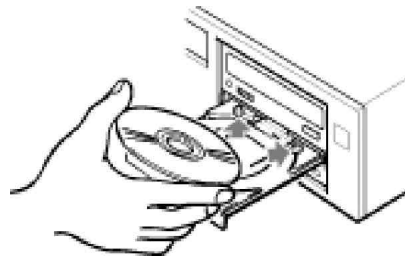
This section describes how to start the drive and eject a disc.

## Starting the Drive

- 1 Turn on the power of your computer.
- 2 Press the eject button.  
The tray comes out automatically.

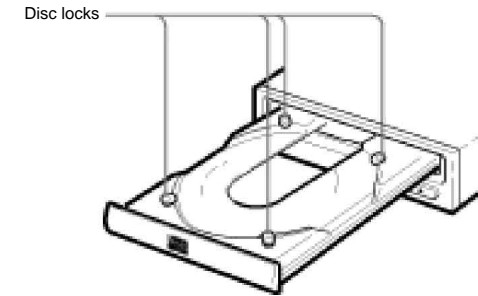


- 3 Place a disc in the tray with its label side up.



### Note:

When the drive is set up in vertical position, use the disc locks to prevent your disc from falling. See “How to Use the Disc Locks” on page 21 for details.



- 4 Gently push the tray or press the eject button to close the tray.  
The drive will begin reading the Table of Contents (TOC) data when it accepts the disc. The busy indicator lights up in amber while the drive is reading the TOC.  
When the busy indicator lights out, the drive is ready to receive commands, and data may be retrieved from the disc.  
After loading the CD-R or CD-RW disc, it takes a moment for the drive to become ready while the Program Memory Area is read.  
For subsequent drive operations, follow the instructions provided with the CD authoring software you are using.

### Note:

The busy indicator stays lit in amber if:

- the disc is not properly placed on the loading tray
- a malfunction occurs.

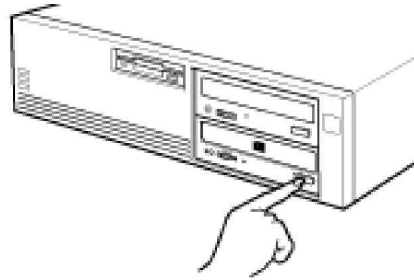
In either case, eject the disc and place it in the loading tray again making sure that it sits properly in the tray. If doing this does not solve the problem and the busy indicator still remains lit in amber, consult your dealer or qualified service personnel.

The busy indicator also lights amber during audio play. However, this is not a malfunction.

**Caution:** Do not forcibly close the disc drawer. Applying excessive force may damage the loading mechanism. The tray’s mechanism is designed to operate with a “feather touch”.

## Ejecting the Disc

To eject the disc, press the eject button on the front panel. The tray comes out automatically.



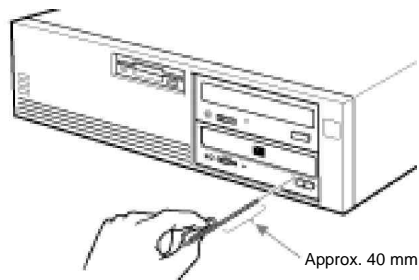
**Note:**

The eject button does not work if it is disabled by the software you are using.

### ■ Opening the tray manually in an emergency

You can open the tray manually when it fails to come out by means of the eject button or software commands. To do this, follow the procedure below:

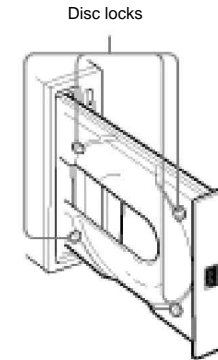
- 1 Turn off the power of your computer.
- 2 Insert a pointed object, such as a paper clip, into the emergency eject hole and push.



After removing the disc from the drive unit, consult your dealer or qualified service personnel.

## How to Use the Disc Locks

The disc tray has four disc locks that prevent the disc from falling when the drive is set up in vertical position.

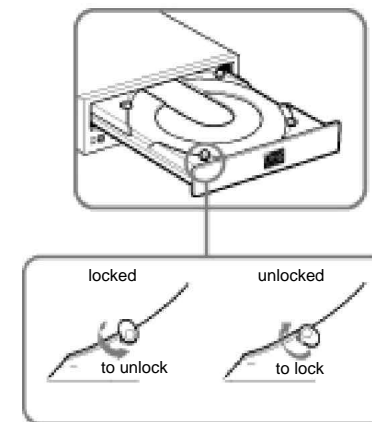


**Note:**

When the drive is used in horizontal position, you do not need to lock the disc.

### ■ Locking and Unlocking

All of the four locks are set in the unlocked position (facing outward) when the drive is shipped from the factory. To set the lock in the locked position, turn it with your fingers until you hear a click so that it faces inward.

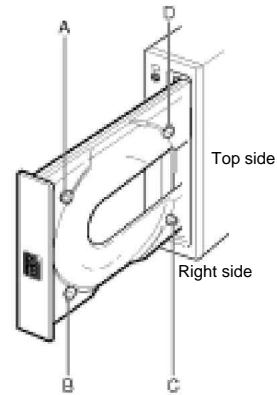


# Specifications

## ■ General

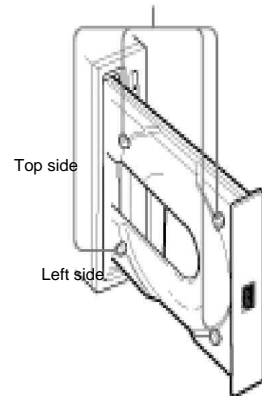
### When the drive's right side is down

To facilitate disc handling, set the disc locks B, C and D into the locked position, and leave the disc lock A in the unlocked position.



### When the drive's left side is down

To facilitate disc handling, set the disc locks A, C and D into the locked position, and leave the disc lock B in the unlocked position.



<b>Host interface</b>	ATAPI compliant
<b>Read Function</b>	This drive conforms to the “Multiread” specification.
Acceptable discs:	CD-ROM data ( <i>mode-1</i> ) CD-ROM XA ( <i>mode 2, form 1 &amp; 2</i> ) CD-Digital Audio Audio-combined CD-ROM CD-I ( <i>mode 2, form 1 &amp; 2</i> ) CD-I Ready Photo CD ( <i>Single and Multi session</i> ) Video CD CD-EXTRA CD-TEXT CD-R ( <i>Conforming to “Orange Book Part II version 3.1”</i> ) CD-RW discs ( <i>Conforming to “Orange Book Part III version 2.0”</i> )
<b>Write Function</b>	
Applied Format:	CD-ROM ( <i>Mode-1</i> ) CD-ROM XA ( <i>mode 2, form 1 &amp; 2</i> ) CD-Digital Audio Audio-combined CD-ROM CD-I ( <i>mode 2, form 1 &amp; 2</i> ) Video CD CD-EXTRA CD-TEXT
Writing Method:	Disc at once Session at once Track at once Variable packet Fixed packet writing (Max packet size : 2088.9 Kbytes) Multi-session
<b>Cache memory</b>	4 Mbytes
<b>Read and Write speed</b>	
Read (CD-Rom/CD-R):	4X, 8X, 13 - 32X (CAV)
Read (CD-RW):	2X, 4X, 8X, 8X - 20X (CAV)
Read (DAO written CD-RW):	4X, 8X, 8X - 20X (CAV)
Read (unfinalized CD-R):	1x, 2X, 4X, 8X, 10X, 8X - 20X (CAV)
Write (CD-R):	1X, 2X, 4X, 8X, 12X.
Write (CD-RW):	2X, 4X, 8X.

■ **Drive performance**

**Data transfer rate**

Sustained rate:

- 150 Kbytes/s mode 1 (1X)
- 300 Kbytes/s mode 1 (2X)
- 600 Kbytes/s mode 1 (4X)
- 1200 Kbytes/s mode 1 (8X)
- 1800 kbytes/s mode 1 (12X)
- 2000 to 4800 Kbytes/s mode 1 (13 to 32X CAV)

- 171.1 Kbytes/s mode 2 (1X)
- 342.2 Kbytes/s mode 2 (2X)
- 684.4 Kbytes/s mode 2 (4X)
- 1368.8 Kbytes/s mode 2 (8X)
- 2053.9 Kbytes/s mode 2 (12X)
- 2281.3 to 5475.2 Kbytes/s mode 2 (13 to 32X CAV)

Max Data Transfer mode: 16.7 MB/s (ATA PIO Mode 4)  
 16.7 MB/s (ATA Multiword DMA Mode 2)  
 33 MB/s (ATA Ultra DMA Mode 2)

**Access time**

Random stroke  
*Block to block:* 150 ms (13 to 32X CAV typical)  
 Random stroke:  
*First to last block:* 350 ms (13 to 32X CAV typical)

■ **Reliability**

Read error rate (includes retry, normal disc)  
 ECC On (mode 1): 1 Block / 10<sup>12</sup> bits  
 ECC Off (mode 1&2): 1 Block / 10<sup>9</sup> bits

■ **Audio**

Output level  
 Line out: +2.5 +/- 1.7dBm at 47 k  
 Head phone: -1.5 +/- 2dBm at 32

■ **Environmental conditions**

Temperature and humidity  
 Operating +5 °C to +45 °C (no condensation)  
 Transportation -40 °C to +60 °C (10 % to 90 % humidity)

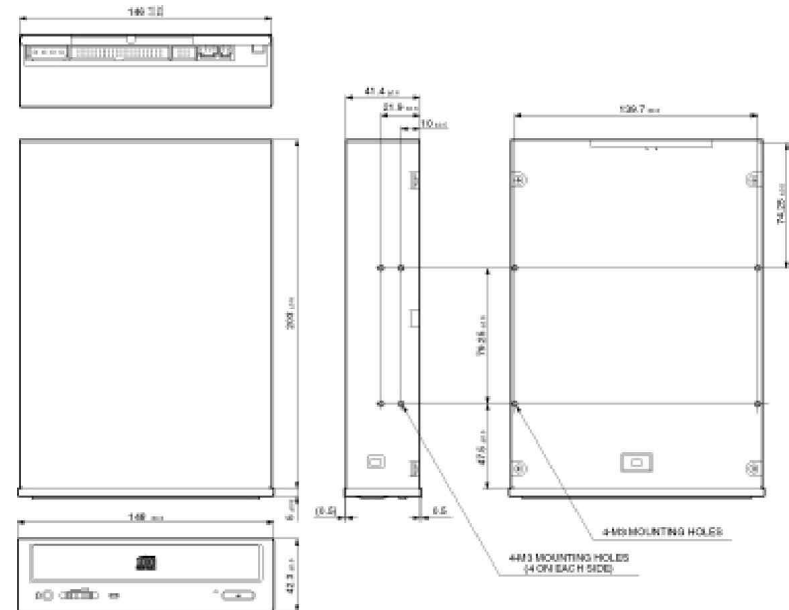
■ **Dimensions and weight**

Dimensions 146.0 x 41.4 x 203 mm ( w / h / d )  
 Mass 920 g

■ **Power requirement**

Voltage +5 V ± 5 % DC and +12V DC ± 10 %  
 Sleep  
 +5 Vdc 150 mA (Typical) < 200 mA (Max)  
 +12 Vdc 0.2 mA (Typical) < 0.3 mA (Max)

■ **Dimension diagram**



**Important:**  
 Screws must not extend more than 6.0mm into the side panels or the bottom plate.